

Recovering Southern Resident killer whales

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Southern Resident killer whales (SRKW) were listed under the Endangered Species Act as 'endangered' in 2005. These whales spend summer and fall in Washington State's Puget Sound. Developing scientific information to support their recovery has been a key task of the NWFSC's conservation biologists.

Killer whales (*Orcinus orca*), or orca, are toothed whales, related to sperm and pilot whales, with a worldwide distribution. Southern Resident killer Whales (SRKW) are an significant population in the Pacific Northwest, spending several months during summer and fall in the San Juan Islands and Puget Sound, and feeding primarily on salmon. This population was reduced dramatically in the 1960s and 70s by marine park captures, when the population reached a low of 71 individuals. Although the population grew into the 1990s, it currently numbers only in the 80s.

Southern Resident killer whales were designated as 'endangered' in 2005 due to their low abundance and variety of threats to their persistence. Specifically, there are currently only a few reproductive-age males in the population, and several females of reproductive age are not having calves. Potential factors affecting their decline or limiting their recovery are: quantity and quality of prey; toxic chemicals which accumulate in top predators, and disturbance from sound and vessel traffic. Oil spills are also a potential risk factor. NOAA finalized a Recovery Plan for SRKW in 2008 and the NWFSC has led the effort to understand the factors potentially limiting this population and inform recovery actions.

Winter habitat

Currently, winter and spring distribution of this population is not well known. Without this basic information, scientists cannot understand SRKW habitat and prey relationships and what other risk factors may be affecting the population when they are outside Puget Sound. Center scientists have used a mixture of land-based sighting networks, coastal cruises, and passive acoustic monitoring to greatly expand our observations of whales on the outer U.S. Pacific coast. These efforts have paid off, with the total number of observations increasing from 14 to approximately 40 over the last five years.

Prey preferences

Chinook salmon, which appear to be the preferred prey of this population are also in decline, and their decline has been suggested as a factor in the decline of the SRKW. Recent work by NWFSC scientists determined which Chinook salmon stocks the whales eat during summer months, and evaluated the whales' likely daily energy requirements. Together, these studies suggest that Chinook salmon abundance is likely a critical factor for whale survival.



The Southern Resident killer whale population is composed of three family groups of whales that have been named J, K and L pods. Each pod has unique vocalizations and individual whales can be identified by their unique markings.

Learn more & come see us in action

Sharing our work with other scientists, policymakers, and the public is important to us. To learn more about what we do, please visit our website at: www.nwfsc.noaa.gov.

To arrange a visit or obtain additional information, please call 206-860-3200.

Additional information on SRKW research (and recovery plan) can be found on our website: http://www.nwfsc.noaa.gov/research/divisions/cbd/marine_mammal/marinemammal.cfm

Contaminant burdens

The SRKW population has extremely high levels of chemical pollutants such as PCBs; this has been offered as an explanation for the low reproductive success and apparently high male mortality. In 2005, Center scientists initiated a biopsy sampling program to obtain small blubber samples from a subset of the population to develop estimates of overall contaminant burden and compare burdens among pods. Samples from J and L pods had different contaminant profiles, indicating that the whales do not eat fish from the same place. Additional biopsy samples will allow Center scientists to further evaluate and compare the impacts.

Vessels and noise

Boat traffic is thought to interfere with whale communication and echolocation possibly affecting their survival. NWFSC collaborations with university and NGO partners indicate that the whales change their behavior when vessels are nearby, although the interactions are complex. The whales also increase their call intensity with increasing background noise. The Center is currently in the process of estimating the energetic costs of increased call intensity and boat avoidance, which help evaluate population-level impacts of vessel disturbance and noise.

Cumulative risk analysis

Understanding how these risk factors interact, and what their relative contributions to SRKW declines might be, is essential for developing a sound recovery strategy. A new project that examines the relationship between the whales' survival and birth rates and range of risk factors—including salmon abundance, the ocean environment, vessel interactions, and gross exposure to contaminants—suggests that the whales' birth and death rates more strongly correlate with Chinook salmon abundance than with any of the other factors analyzed.

